

Notice of Allowability

Application No.

10/715,831

Examiner

Christopher Verdier

Applicant(s)

HELLMANN ET AL.

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to ____.
2. ☒ The allowed claim(s) is/are 1-11.
3. ☐ The drawings filed on ____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 11-19-03
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date ____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with J.D. Evans, Attorney of Record, on November 23, 2004.

The application has been amended as follows:

In the Specification:

In paragraph 11, line 3, after "conditions" --, such as impermissible cavitation conditions, -- has been inserted.

In paragraph 21, line 3, after "conditions" --, such as impermissible cavitation conditions, -- has been inserted.

In the Claims:

In claim 7, line 2, after "between", -- a -- has been inserted.

In the Drawings:

Art Unit: 3745

The following changes to the drawings have been approved by the examiner and agreed upon by applicant: In order to avoid abandonment of the application, applicant must make these agreed upon drawing changes.

In figure 3, approval is granted to eliminate the filled in black portion of pump 24.

The changes to the specification have been made to provide antecedent basis for the subject matter of claim 8. The above change to claim 7 has been made to correct an informality therein. The above drawing change has been preapproved in order to eliminate the blackened portion from figure 3.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: The instant application is directed to an unobvious improvement over the invention patented in U.S. Patent 6,568,901 to Wang, which discloses a centrifugal pump having a balancing device 4 that comprises an axial gap 8 through which a balancing flow is conducted, with a balancing device spring element 10 which is deformed by axial thrust of the pump to oppose complete closure of the axial gap. The improvement comprises a method of fault detection in the pump, by measuring the deformation of the spring element during pump operation and starting from the pump characteristic curve of the centrifugal pump and the spring constant of the spring element, drawing a conclusion regarding the current operating state of the centrifugal pump based on the measured deformation (claim 1). The improvement also comprises means for measuring the

Art Unit: 3745

deformation of the spring element and correlating the measured deformation of the spring element with the operating state of the pump (claim 9). None of the prior art of record discloses or suggests the improvements. The WIPO Document WO 00/77405 lists German Patent 886,250 as an "X" reference, but the German Patent only discloses a pump with a spring 14 that maintains an interval spacing between elements 15 and 21.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pope is cited to show rotor thrust balancing by means of a strain measuring device, a signal amplifier, and a controller that controls supply of hydraulic fluid to the rotor.

Barhoum is cited to show a pump with a thrust balancing piston.

Morzynski is cited to show a pump with a bearing free to shift axially which is opposed in the delivery direction by a spring.

Art Unit: 3745

Japanese Patent 55-87,889 is cited to show a centrifugal pump with an abnormal balancing detecting device in the form of slip ring and an alarm circuit.

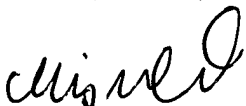
German Patent 886,250 is cited to show a pump with a spring 14 that maintains an interval spacing between elements 15 and 21.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.V.
November 23, 2004


Christopher Verdier
Primary Examiner
Art Unit 3745